<table>
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<th>Title</th>
<th>Food to Food Fortification with Baobab Fruit Pulp and Moringa Leaf Powder as A Pathway to Improve Food and Nutrition Security among Women and Children Benin, West Africa</th>
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</thead>
</table>
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Faculty of Agronomic Science  
University of Abomey-Calavi |
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Faculty of Agronomy  
Department of Economy and Rural Sociology |
| Purpose | To use baobab fruit pulp and moringa leaf powder for food to food fortification, to alleviate micronutrients deficiencies among vulnerable groups in Benin (West Africa). |
| Project Summary | The Food and Agriculture Organisation of the United Nations (FAO) estimated that between 2012-2014; 795 million people are chronically undernourished on a global scale with every one in four persons being undernourished in sub-Saharan Africa. In Benin, 1.1 million people are food insecure with 34% of households being unable to obtain adequate food. In addition, micronutrient deficiencies constitute a major threat to maternal and child well-being. Indeed, the last global nutrition report reported high anemia rate and occurrence of vitamin A deficiency among pre-school children in Benin. With such a discouraging picture, improvement of food and nutrition security becomes crucial. Important sources of household nutrition in West Africa includes forest food resources which are proven to have high content of nutrients compared to daily needs and are already integrated to the diet of local populations. Among others, baobab fruit pulp and moringa powders may be promoted. The present project aims at using baobab fruit pulp and moringa leaf powder for food to food fortification, to alleviate micronutrients deficiencies among vulnerable children under 5 and women of reproductive age in Benin. A literature review followed by a survey will help to Map local food matrices that are the most suitable to food to food fortification. Digestibility studies will be performed using in-vitro digestion at laboratory scale. For the in vitro digestion, food samples will be degraded using enzymes similar to those found in the human digestive system. Digestibility studies will be performed on food matrices and baobab and moringa powder and will allow determining the right combination for adequate nutrients absorption. Food to food fortification formula will be developed and used for trial |
on the field to measure their impact on the nutritional status of the study population (children under 5 and women of reproductive age). The present project will provide adequate food to food formulation including Baobab fruit pulp and moringa leaf powder for improving nutritional status of vulnerable groups. In addition, the present project will train 2 MSc students and 2 undergraduate interns to good research implementation to impact development.

<table>
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<th>Country and specific locations</th>
<th>Benin</th>
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| Participating institutions     | • Association Béninoise du Moringa (NGO)  
• Department of Economy and Rural Sociology, Faculty of Agronomy, University of Parakou, |
| Start date                     | 1st July 2015 |
| End date                       | 30th July, 2017 |
| Budget                         | USD 59,783 |

**Flora Josiane Chadare (PhD)**

Flora Josiane Chadare, is Senior Lecturer in the University of Abomey-Calavi. She holds a PhD in Food Science and Nutrition (Wageningen University in the Netherlands), BSc. in Agricultural Engineering (Nutrition and Food Science; University of Abomey-Calavi), MSc. in Food Technology (Ghent University - Catholic University of Leuven, Belgium), and Master of Food Science and Nutrition (Ghent University, Belgium). Dr. Chadare has undertaken research as a principle investigator and collaborator on various projects focussing on microbiological and nutritional value, product development, process technology, indigenous knowledge of traditional foods in general and non-forest food resources in particular. The most recent of the project is the RUFORUM funded Graduate Research Grant (GRG) that will train 2 MSc students and 2 undergraduate interns. She was awarded a Storm van der Chijs stipend from Wageningen University in 2008. In the recent past, Dr. Chadare received the Second Prize of Japanese Award for Outstanding Research on Development 2015 of the Global Development Network. Dr. Chadare has focused her research passion to enhance the use of local food resources to alleviate food and nutrition insecurity and improve livelihoods in Africa while working closely with local populations especially the most vulnerable. Besides technical competence in food science and nutrition, Dr. Chadare has expertise in qualitative research techniques to grasp opinions and perceptions of individuals and groups according to a theme/topic/idea and is used to scientific studies related to food quality and valorisation of indigenous food knowledge and wild edible resources for food and nutrition security. Dr. Chadare is member of International Society for Horticultural Science, Tropical and subtropical Fruits, Inter-institutional Consortium for Indigenous Knowledge and of Food Studies Knowledge Community.

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Selected publications


Selected funded project

- **2015-2017** (24 Months): Using novel techniques to map biodiversity and identify priority wild edible plants for food and nutrition security in Benin (West Africa). Japanese Award for Outstanding Research on Development, second prize ($ 10,000). **Principal Investigator**

- **2015-2018** (36 Months): Designing appropriate agronomic and processing practices for pineapple supply chains in Benin. WOTRO ARF food and business applied research fund, The Netherlands (€ 299,950). **Collaborator**

- **2014-2017** (36 Months): Infant foods from local resources as a pathway to a better food and nutrition security in Benin (INFLOR). WOTRO ARF food and business applied research fund, The Netherlands (€ 361,860). **Collaborator**

2013-2014 (18 months): Niche modelling and assessment of local knowledge, use patterns, functional properties and contribution of *Synsepalum dulcificum* (Sapotaceae) to rural women’s income in Benin, West Africa. CODESRIA National Working Groups 2012 ($18,000); Collaborator

2012-2015 (36 months): Gouvernance des Fabriques de produits d'Identité de Terroir pour la prospérité des Exploitations Agricoles et de l'Artisanat agro-alimentaire au sud et moyen Bénin. Interfaculty and interdisciplinary research fund. UAC competitive fund 2002, Benin (28,000000 fcf = € 42,600); Collaborator

2006-2010: Baobab foods products from Benin: composition, processing and quality. PhD Research. Netherlands Fellowship Programme, (The Netherlands) (€75,000); PhD Researcher.